

AMENDMENT OF CLAIMS

Amend the claims as follows. This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (Currently amended) A method for operating a communication system, comprising steps of:

defining the system as a combined Code Division Multiple Access CDMA and Frequency Division Multiple Access FDMA system, wherein CDMA is used within each FDMA sub-channel, and a plurality of PN code channels are available in each of the FDMA sub-channels; and

using at least one base station and a plurality of subscriber stations, where the at least one base station and each of the plurality of subscriber stations have a plurality of frequency agile and PN code agile data modulators and demodulators, and wherein each of the frequency agile and PN code agile data modulators and demodulators can be selectively tuned to separate PN code channels operating within the FDMA sub-channels;

~~using a variable bandwidth waveform with multiple bonded transmitters and receivers that are each agile in both frequency and code to provide a variable bandwidth and variable rate multiple access system~~

determining current transmission requirements based, at least in part, on operating conditions; and

selecting a number of FDMA sub-channels sufficient to meet current transmission requirements, wherein the system operates as a variable bandwidth system as the number of FDMA sub-channels varies due to transmission requirements.

2. (Original) A method as in claim 1, wherein the use of both CDMA and FDMA together provides an improved concentration efficiency by making a larger pool of bandwidth available to each user.

3. (Currently amended) A method as in claim 1, ~~wherein channel bonding across both code space and frequency space enables the system to operate in at least one of a variable, contiguous or non-contiguous bandwidth at a finely variable rate~~ further comprising:

performing channel bonding in both code and frequency space by bonding PN code channels from separate FDMA sub-channels.

4. (Currently amended) A synchronous Code Division Multiple Access CDMA and Frequency Division Multiple Access FDMA communications system, comprising:

a plurality of FDMA sub-channels, wherein CDMA is used within each of the FDMA sub-channels;

a base site comprising a transmitter for transmitting a waveform and further comprising a plurality of frequency agile and PN code agile data modulators having an

output coupled to a radio channel, wherein the transmitter is operable to perform channel bonding in both frequency space and code space by bonding PN code channels from different FDMA sub-channels, forming an effective channel; and

a subscriber unit comprising a receiver for receiving the transmitted waveform from the radio channel and further comprising a plurality of frequency agile and PN code agile data demodulators, wherein the subscriber unit is operable to receive data transmitted in the effective channel formed by bonding PN code channels from different FDMA sub-channels.

5. (Original) A CDMA and FDMA communications system as in claim 4, wherein there are N modulators and N demodulators each operable for communicating at data rates that are power of two multiples of a basic rate on a plurality of frequency subchannels within a channel.

6. (Original) A CDMA and FDMA communications system as in claim 5, wherein said N modulators and N demodulators operate with power of two multiples of the basic rate from a minimum rate to a maximum rate at a granularity that is an integer multiple of the basic rate.

7. (Original) A CDMA and FDMA communications system as in claim 4, wherein statistical concentration is achieved when the system has Y Mbps of aggregate capacity allocatable to X users simultaneously at rates Y/X Mbps each, and by tuning

said modulators and demodulators to any one of Z frequency subchannels, the useable bandwidth is Z times the Y Mbps bandwidth of any one channel, and $Z \cdot X$ users are supported simultaneously at rates of Y/X Mbps.

8. (Original) A CDMA and FDMA communications system as in claim 4, wherein a bandwidth of any one subchannel is X MHz, and at least some of said plurality of modulators and demodulators are tuned to different ones of contiguous or non-contiguous X MHz sub-channels within a Y MHz channel, where $Y > X$.

9. (Original) A CDMA and FDMA communications system as in claim 8, wherein $X = 3.5$ and $Y = 14$.

10. (Original) A CDMA and FDMA communications system as in claim 4, wherein input data to said plurality of modulators is a punctured convolutional code.

11. (Original) A CDMA and FDMA communications system as in claim 4, wherein input data to said plurality of modulators is a rate $\frac{1}{2}$, constraint length 7 code that is punctured to increase the rate.

12. (Original) A CDMA and FDMA communications system as in claim 11, wherein the puncturing rate is made adaptive to mitigate fading conditions.

13. (Original) A CDMA and FDMA communications system as in claim 11, wherein said output of said modulators is coupled to said radio channel through an end-to-end raised-cosine Nyquist pulse shape filter.

Please add the following new claims:

14. (New) A method for operating a communication system, comprising steps of:

defining the system as a combined Code Division Multiple Access CDMA and Frequency Division Multiple Access system; and

using a variable bandwidth waveform with multiple bonded transmitters and receivers that are each agile in both frequency and code to provide a variable bandwidth and variable rate multiple access system, wherein channel bonding across both code space and frequency space enable the system to operate in at least one of a variable, contiguous or non-contiguous bandwidth at a finely variable rate.

15. (New) The method of claim 14 wherein channel bonding across frequency space bonds FDMA sub-bands together.

16. (New) The method of claim 14 wherein channel bonding across both code space and frequency space bonds CDMA channels from different FDMA sub-bands together.

17. (New) A method for operating a communications system, comprising steps of:

defining the system as a combined Code Division and Frequency Division Multiple Access FDMA system, wherein CDMA is used in each FDMA sub-band;

using a variable bandwidth waveform with multiple bonded transmitters and receivers that are each agile in both frequency and code to provide a variable bandwidth and variable rate multiple access system, wherein channel bonding occurs across both code space and frequency space.

18. (New) The method of claim 17 wherein channel bonding across both code space and frequency space enables the system to operate at a finely variable rate in a variable bandwidth comprised of contiguous FDMA sub-bands, wherein the number of FDMA sub-bands used varies in dependence on operating conditions.

19. (New) The method of claim 17 wherein channel bonding across both code space and frequency space and frequency space enables the system to operate at a finely variable rate in a variable bandwidth comprised of non-contiguous FDMA sub-bands, wherein the number of FDMA sub-bands used varies in dependence on operating conditions.